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## PUSH? OR PULL?<sup>1</sup>

### CONTRASTED VIEWS OF THE NATURE PROCESS.

"Yet I doubt not through the ages one increasing purpose runs."  
—*Tennyson.*

THE ancient world had seven recognized, almost legalized, wonders. Though some might object to the particular selection, it was generally admitted that whatever they were there could be no more and must be no less than just so many,—for were there not just seven wonders of the sky, the seven wandering stars, and has not Winckler taught us, though Kugler would now unteach it, that in the old-oriental world-conception the history of earth was only a reduced image of the history of the heavens? To-day we have many more wonders than even seven times seven, but still we feel there should be just seven pre-eminent, and men of science are called on to decide by vote which they shall be! An excellent way this, to decide such questions and all others—by vote, provided only you are able to *weigh* the votes instead of merely counting them. Whatever these marvels of modern time may turn out to be, they will surely be marvelous enough, yet it seems that in all ages both ancient and modern by far the greatest wonder is Time itself. A rich and glorious word, far finer than the Dutch *tijd* or the German *Zeit*, or the Latin *tempus* or any of its derivatives, yielding only to the majestic Greek *aiōn* or *chronos*; far nobler than Space, which sounds thin and empty in comparison with the resonant

<sup>1</sup> Address before the Beta Chapter of the Phi Beta Kappa Society, University of Virginia, June 12, 1912.

German *Raum*. Pronounce infinite Space! how faint and feeble by the side of eternal Time! It is not alone however in the fulness of its diphthongal sound that Time surpasses Space, but far more in its inexplorable mystery, in its unfathomable depth of meaning. Space stands always before us, almost visible, solid, continuous, immeasurable, indestructible, immutable, everywhere the same. But Time seems at once more immovable than the firmament and more fickle than the wind, more fluctuant than the wave; more evanescent than the lightning flash, and yet more permanent than existence itself—the quintessence of contradiction, the apex, the node of all propositions, wherein all the threads of affirmation intersect and deny one another. Space has indeed its three dimensions, its triple infinity of determinations, its up and down, its right and left, its fore and aft, but it seems to have these everywhere exactly alike. Time has them not. It stretches itself out in one straight tract backwards and forwards interminably, but at once everywhere and nowhere alike. Down the long line unending rushes the momentary, the tremendous specter of the Present, the eternal visionary Now, shining with intolerable splendor, while far behind lies the dark, the dread, the desert pathway of the Past, which has been and is not nor ever more shall be, and before it the still darker more mysterious pathway of the non-existent Future, which is not nor has been, waiting to flash up momentarily into being and then sink back instantly into the opening sepulcher of the perpetual Past.

It is this deep-seated contradiction, this sense-bewildering, thought-confounding flight of the everlasting, the instantaneous Now, that has moved the German poet to his wonderful verses:

“Threefold is the step of Time:  
Lingering comes the Future drawn toward us,  
Arrow-swift is flown the Present,  
In stillness everlasting stands the Past.”

How much of time is ever existent? The Past has been, but is not; the Future is not, but will be; only the infinitely thin Present is. Like the whirling sword of flame wherewith the Eddystone lighthouse, that guardian cherub of the deep, cleaves in sunder the whole sphere of darkness that envelops it, so the gleaming vision of the Now cleaves with its film of unwearied radiance the solid blackness of the Future and the Past.

In all ages this majestic march of Time, this more than archangel flight of the Alone to the Alone, has bowed in reverential wonder the soul that dared to gaze upon it, and the soul has taken refuge from the fearful vision in the idea of the changeless God. "O Lord," exclaims the Psalmist, "Thou hast been our asylum from age unto age. Before the mountains were born or ever had been brought forth the earth and the world, even from everlasting unto everlasting, Thou art God. Thou turnest man unto dust and sayest, Return ye children of the earth-born. For a thousand years are in thy sight but as yesterday, so swiftly flown, and as a watch in the night." But man the thinker, the son of science, has not been content with the awful spectacle of the flitting Present; he has constructed for himself the solemn procession of the moveless Past and has called it history. Gone though it is like the lightning-flash, he still clasps it in imagination, like Ixion embracing the cloud for Hera. Yea, more, he has endowed it with invincible vitality. He has filled it in his fancy with all the seeds of both Present and Future. Even the natural man, the man innocent of all science, does this in large measure. He relates the Present to the Past not only in the order of before and after, not only in the relation of antecedent and consequent, but also in the far deeper mode of cause and effect. He says that the Past has made the Present what it is, that some subtle invisible linkage has bound together into one all the vision that is with all the visions that have

been. Even the man guiltless of all science, much more of all philosophy, does this, yea, even perhaps the spirit that still slumbers beneath us in the mere animal nor has mounted manward through the spires of form.

It is then the law of man's nature, perhaps the law of all nature, to vivify this lifeless Yesterday and to set it in vital determinative relation with To-day. The dead Past is indeed conceived by us as sempiternally living on in the Present, as making the Present what it is, with iron and inexorable necessity. Such is the prevailing scientific conception of fate, of destiny, more terrible than ever inspired the choral chant of an Æschylus or Sophocles. We call it Determinism, or, as Vito Volterra might prefer to say, mechanical heredity. The modern mind plays with this terrific conception as a child might play with a thousand horse-power dynamo or disport itself in the engine-room of the super-dreadnaught Thunderer. In comparatively few souls is the reaction at all appropriate to the imperial majesty of the idea itself. That the living breathing Present should thus lie grasped in the ghastly death's-hand of the Past is a conception that should be awesome and overpowering to whoever regards it directly, face to face. Yet such is its weird sublimity that the greatest minds of the world have rejoiced in it beyond measure and have proclaimed it with a genuine transport of enthusiasm. Nay, they have not been content to pronounce this absolute lordship of the Past over the Present, but they have stretched out its scepter over all the Future.

In a remarkable and oft-quoted passage, the famous wizard of the heavens, Pierre Simon Laplace, intoxicated with the prowess of his invincible analysis as perfected by his mighty compeer Lagrange, the two forming the most prodigious logical engine the earth had ever seen,

"Two coursers of ethereal race  
With necks in thunder clothed and long resounding pace,"

that bore the car of mathematics in triumph through the conquered skies, Laplace, I say, has rightly declared that a sufficiently powerful human intellect armed with differential equations and an absolutely exhaustive knowledge of the physical universe at any stage of its being, could thence deduce its necessary and certain condition for any and all future times, or that knowing one moment completely he would know or at least be able to find out all the history of the interminable ages to come. Such an intelligence has been called a Laplacian intelligence, and it is not strange that man should pride himself on the creation or at least the possession of such stupendous powers of prophecy, of which he does indeed make brilliant use in forecasting eclipses and other phenomena exactly, to the second. Similarly, he vaunts that he could predict the exact spot, the exact speed, direction, and acceleration of each and every molecule now in our bodies, not for a day or week or year, but for all the æons of everlasting Time.

If we turn from astronomy to biology, we find there sole-reigning a concept of kindred grandeur and terror, the concept of heredity. The biologist, in particular the geneticist, beholds in each individual the highly complicate but perfectly definite knotting together of a countless number of strands of inheritance, fine, delicate, but infrangible filaments, compared with which the ultimate filaments of a spider's line are thicker than cable cords, out of which is woven without seam from top to bottom the infinite web of plant and animal history, "the garment of life that the Deity wears." These endlessly fine strands stretch back, unbroken, in rigid continuity through all generations, here and there coalescing in pairs, to knot themselves together into a new individual, whence however the same filaments emerge to be knotted together into still other combinations, and so on forever. As the shuttle flies back and forth in the whirring loom of time, the web

of life, the garment of the Godhead, grows and grows without ceasing, but the strands of heredity, the filaments of inheritance, remain the warp and woof in that universal loom. You are what you are because your parents were what they were, and they because theirs were what they were, and so on backward forever, yea, so on forward till the crack o' doom. Thus the Past, the remotest Past, reaches out its skeletal fingers and grapples both Present and Future in its grip of death. I repeat, such is the tragic grandeur of this conception that it has fascinated and enthralled the mightiest intellects, who gaze upon it as upon the visage of Medusa and are turned to stone.

When now we ask how we know that all this is true, that To-day and To-morrow are thus despotically dominated by Yesterday, that some single push from behind has propagated itself like an ether wave through all the world and determined all that is or has been or will be, the answer seems at first utterly inadequate. Express it in high-sounding phrase as you will, talk about Time as an *a priori* form of our sensibility, about the necessity and universality and objective validity of the category of causality—all these resounding vocables tell us finally but very little. The fact is, they mean that it is all only a way of thinking, which is indeed a part of our inmost nature and being, but still is after all a way of thinking, of self-interpretation of the spirit to itself, of constructing and imaging to itself its own experience. When the billiard ball A strikes the billiard ball B, the latter moves, and we say that the impact made it move, that it would not have moved but for that impact, that the momentum of A has passed over into B, that A's motion was the cause of B's. Nor is there any objection to such expressions. It is good that they are not objectionable, it would be very sad if they were; for they are the best we have, and there is no likelihood of any change or improvement. But when we ask how we know that A's

movement caused B's, we are dumb. We can perceive no causal nexus, no interlocking of the two events. So far as we can observe they simply follow one the other. We can never go back and undo the event and find out what would have happened if A had not struck B. "Now of deeds done," saith Pindar, "whether they be good or ill, not even Time, the father of all, can make undone the accomplishment." The most, the best, the last that we can know, is that the one event followed the other in this case, and similarly in all hitherto observed cases, and we may believe ever so confidently and unshakably that such a relation will always hold good. But the causal tie we shall never perceive, we shall never know that there is any at all. So much at least the great Scotchman has done for philosophy, for it is the unique merit of Hume to have perceived, first of men, the true state of case clearly.

We may, then, or we may not go on speaking of cause and effect and of the Past as determining the Future. In mechanics the notion of cause as agent has been surrendered. In a passage that has become classic, Kirchhoff declared even as long ago as 1877 that mechanics is the science of motion, its problem being to *describe* the motions of nature completely and in the simplest way. You observe that there is no reference here to cause or to effect or even to *force*. The motions in nature from the rush of a planet to the vibrations of a molecule, are to be *described* completely and simply, as a dance of atoms, where the motions and evolutions of each dancer are highly complicate and intricate and definitely related to those of every other, yet each carries on its own dance, and naught is said of one's affecting another. It is not a waltz, they do not even touch hands. But in ordinary work-a-day life we may still use most profitably the old forms of speech, even as in law, where half the time of instruction is given to explaining the new meanings of old terms. Nevertheless, it is a great



gain to perceive that these are after all only forms of speech corresponding to settled ways of thinking and not rendering adequately any inherent nature or quality of the happenings themselves. It is a great gain and a great relief to know that the despotism of the Past is after all only our own way of thinking about events, of ordering the totality of soul-experience serially, of smoothing out the infinite flexures of the crumpled rosette of the spirit into the shining silken ribband of history. Ah! you say, a wonderfully folded strip is must be, that can be smoothed out thus interminably. Yes, wonderful! indeed, unimaginably but not unthinkably wonderful. For the famous curve of Weierstrass, the exactest of all mathematicians, is crinkled in precisely this way; between any two of its points the length of the curve is infinite; if you clip out over so small a section and stretch it out, smoothing out the crinkles, you may smooth it out to infinity. We need not, then, stumble here.

It is very rare that a deep philosophic dogma may be distinctly visualized and made indeed palpable to the sense. But such is our strange good fortune in the case of the doctrine in hand, that the causal nexus does not lie between cause and effect in the realm of observed events, but lies if anywhere far back in the determination of the mind, which is depicting its own experience on the broad deep canvas of Space and Time. We all know about living pictures, and the few whose bank balances will allow it, are prone to while away an hour beholding the moving spectacle. All the most complicated events of life both real and imaginary are there represented with a vividness to which there is theoretically no limit. But surely no one dreams that any event there enacted stands in any causal relation with any other. There you may see the ball A strike upon the ball B, and see this latter speed away, but you know that the motion of the one had naught to do with

the motion of the other. If through some defect in the film the whole motion of A had dropt out, the other ball B would have moved precisely as it actually did. The whole system of motions, antecedents and consequents, exists beforehand simultaneously in the film, which itself is a construct of human intelligence imitating itself in this amazingly simple contrivance, which yet produces such multiform results. Very nearly so, to set forth great things by small, is the panorama of the world in Space and Time—a vast vision of the mind's own experience, a moving picture in which all the elements seem riveted together by adamantine nails of cause and effect, but nay, not so! The connections are not between the pictures but lie far behind in the film of our own souls, in the simultaneous psychic experience of the individual, of the race, of the whole creation of spirits that constitute the republic of heaven, the city of the living God.

So much for the tyranny of the Past, over Present and Future. It is a shadowy unreal scepter that is stretched out from that universal mausoleum of vanished ages. But you will say, "Well, after all, things do actually happen in fixed determinate order; the dance of the seasons is never in changed or inverted succession; still the circling hours speed on as ever, Spring clasps the hand of Summer, not of Autumn, and Winter, the old reprobate, still lingers in the lap of Spring. The unvaried orders of sequence and coexistence, which we call laws of nature, do still obtain as a matter of fact, and woe unto him who denies or defies them. What then is the difference, since all things take place *as if* the causal knots were there, whether they be really there or no? Is it not like asking whether the planet that the astronomers call Saturn be really Saturn or not?" Great indeed is the magic of the little words *as if*.<sup>2</sup> Un-

<sup>2</sup> There has recently appeared an imposing work, by Vaihinger, on *Die Philosophie des Als Ob*.

Of course, neither the phrase nor the idea is by any means new. As early

doubtedly the orderly process of nature is just what has been asserted, and well indeed for us that so it is, for otherwise the universe would be naught but an immeasurable madhouse, an asylum of the insane. But the *meaning* of the order is to be sought and found not in the visible infrangible structure of a material universe, lying out there beyond all consciousness, beyond the utmost reach of the soul, in iron strength, in rocklike rigidity, more insensible to the voice of spirit than the granite mountain to the cry of the wind, which was and is and will be when all life shall be swallowed up in the crash of worlds, in the star-dust of primeval chaos returned,—nay, not there! The meaning of the order, yea, the intelligible order itself is to be sought and found all and only in the constitution of the mind, in the nature of the soul, in the self-chosen forms of the activity of Spirit itself. If then the pace of the stars is steady, if the earth spins softly, uniformly on her unwearied axis,

“Day’s Eden brightness still relieving  
The awful night’s intense profound,”

it is not because atoms are attracting each other according to the Newtonian law of gravitation, but because they are moving *as if* they obeyed that law; because both they and their regular motions are the mind’s own projections of its own activities, and because those activities themselves are not at random but are inherently self-articulated, are implicated in a divine and eternal Order, whose everlasting *image* is the history of the universe in space and time.

Now, I maintain, it is no light or unimportant matter

as 1881, in a public lecture, printed in the *Quarterly Review of the M. E. Church, South* (April 1884), both the phrase and the idea were used by the present writer, and since then repeatedly and elaborately in various connections. Similarly and independently Dr. Carus has amplified the same notion in the same terms in his *Foundations of Mathematics* (1908, see page 79), in an article “The Soul in Science and Religion” in *The Monist*, 1906 (especially pages 250-252) and elsewhere, as is noted in his review in the September *Open Court* of Vaihinger’s work, which itself dates back in large measure a full generation. The connection with pragmatism, as originally conceived and formulated by Charles Sanders Peirce, is obvious and important.

that the soul should understand and appreciate this state of case, that it should realize its supreme lordship over nature and nature's laws, that it should insist upon its indefectible title to the magistracy of the whole material world. We could not, we would not abrogate the laws of nature, the principles of gravitation, or chemical affinity, or surface tension, or even of natural selection. But why? Because they lie outside, beyond, and above our poor frail human nature? Nay, but because they lie within our nature, deep in the unexplored, unconscious, and universal depths, sunk far below the utmost plummet of *individual* experience. "When I gaze upon the heavens, the work of thy fingers, the moon and the stars, which thou hast ordained, What is man that thou art mindful of him, and the son of man that thou visitest him?" The Psalmist was right; he does not mean what an insignificant creature, but what a wonderful being is man, whom even Jehovah visits and crowns with glory and honor. The spectacle of the heavens has been thought to bow and humble the over-proud earth-born into dust by showing him his littleness and impotence; nay, but it should rather exalt and magnify the soul of man, who beholds therein his own wonderful creation. He who peers into the silent depths of the sky is really gazing into the mirror of the fathomless abysses of his own being. He who distinctly realizes this will not be terrified by any calamity that can overtake this image, neither by death nor by any other disaster; yea, though the heavens themselves should depart as a scroll when it is rolled together, his soul will remain a stranger to fear, for he will look for a new heaven and a new earth, not made with hands, the workmanship of universal Spirit.

No man that has once climbed this Pisgah peak and beheld the kingdom of the soul and its glory will ever surrender it. Well do I remember how in early years many

times I repeated to myself the stately lines of the elder Darwin:

“Star after star from heaven’s bright arch shall rush,  
Suns sink on suns and systems systems crush,  
Headlong, extinct to one dark center fall,  
And night and death and chaos mingle all.  
Till o’er the wreck, emerging from the storm,  
Immortal Nature lifts her changeful form,  
Mounts from his funeral pyre on wings of flame,  
And soars and shines, another and the same.”

The grandeur of the verses would awe and melt even as it still awes and melts my soul. But never could I repress a feeling of intense dissatisfaction. What! Can this be all? What possible even least worth or meaning or self-justification can there be in a course of history that is born from chaos and dies in chaos, to be re-born from chaos again? Of what avail for Nature to mount from her funeral pyre and soar and shine in everlasting cycle, if only to sink back again in night and death, like a succession of aimless rockets shot up into the empty dark? What possible interest can any intelligence feel in a Nature that does nothing but “cast up from her dark abyss unceasing transformations of herself,” without purpose and without aim?

But some one will say this is merely an esthetic, not a rational or logical, consideration. The fact is, he will urge, precisely as stated. Nature does precisely this thing, neither more nor less, and that is the end of it. Whether puny man be satisfied with this procedure of Nature, makes no difference; she is utterly devoid of feeling and cares not a straw for all the men in the world. *Sauve qui peut* is her motto. Such is “natural selection,” the “survival of the fittest,” where there is absolutely no standard or evidence of fitness but the fact of survival. This survivor is one of the fittest. How do you know? Because he has survived; therefore he must have been fitter than those who did not survive. Whether his superior fitness consisted in strength or in

cunning, in great size or in small, in speed or in sloth, in bright colors or in dull, makes no difference whatever. Nature has no end, no aim, no purpose in view. The initial push given in the primal curdling ether has passed on down the expanding ages, it strikes the Present from the bosom of the Past, like the bolt of Bellerophon launched from the chill bosom of the desert air; it determines all the Future with the mathematical necessity of the successive terms in arithmetic or geometric or other more complicate series, and propagates itself on forever, irresistible as lightning, unfeeling as stone, and blind as the blackness of midnight.

This appalling conception of history is the unavoidable consequence of any and every theory that accepts the outward universe at its face-value, as an ultimate reality, that thinks the world under the category of causality, that seeks to understand the Present and the Future as a necessary consequence of the Past. The whole doctrine is in the last degree logical, it has achieved great triumphs in the annals of thought, and it may very profitably be entertained as merely provisional, as a directive or working hypothesis, as an outward sensual symbolism of an inward spiritual truth. But as the truth itself, as the final word in world-interpretation, no matter by what high-placed prophets it may be preached, we must reject it utterly, not only as false, but also as an abomination. For we have just seen that there is no ground at all for supposing any such causal activity in the world of sense; any real action of one atom upon another, whether together or apart, remains forever unthinkable as well as unobservable. Moreover, a blind process of nature would be always unintelligible, and for several reasons. Even if we make the very minimum of assumption and try to deduce all the laws or habits of nature from mere chance, as simple grooves worn out in the loam of history by the ever-rolling wheel of events, still we must

assume the properties of numbers and the laws of chance, we must assume some medium, some vehicle of events, and must endow it with some definite properties, otherwise it remains unavailable for thought. By no analysis can we ever get out of these assumptions more than we put into them, and any additional property, any new synthetic judgment, will be merely a new assumption.

We cannot then start Nature out totally blind, acting perfectly at random, otherwise she could never select at all, having no principle of selection. Even in her most elementary processes there must be some choice, some preference for this rather than that. Otherwise why should Newton's gravitation take place according to inverse squares rather than inverse cubes? If you explain this by some still more elementary action, as of extra-mundane corpuscles or of ethereal vortex-atoms, the difficulty will be deferred but not removed, the obstacle will be rolled back but not away; for like questions will still be in place. Why do the corpuscles move in right lines? Whence the vortices in the ether? In short, there cannot arise a definite world, a world that is this and not that, except through difference and the recognition of difference somewhere in the generative process. But a blind Nature or nature-process could not recognize any difference,—this indeed is what we mean by her being blind. She cannot then be wholly blind, but must see ahead. A choice cannot refer to what has been or is, but only to what shall be. By the fittest we do not mean the fittest for the Past but for the Future; if not fittest for the Future, it will not survive. We may see then that the conception of a blind or aimless nature-process is not ultimately realizable in thought. It is exactly as if one should postulate an original impulse or push that had no particular direction at all. Such a push of equal intensity in every direction would annul itself and reduce to absolute zero.

But it is not only on such broad and abstract ground that we affirm the necessity of the notion of aim or direction in the conception of the nature-process. When we appeal to human experience, *the final and supreme court of cassation*, we find that no reasoning being reposes on anything else in thinking the conduct of reasoning beings. Anaxagoras had the high honor of being the first to declare that Mind ruled the world. But he was unable, of course, to apply his great idea consistently towards the explanation of the course of nature and so had to fall back upon the conceits of his illustrious predecessors, the Greek philosophers of nature. For this inadequacy he is sharply rebuked by Socrates in the *Phædo*. Logically and philosophically Socrates was right, but we should do Anaxagoras a great wrong to judge him by a system of notions of which he was ignorant, that had not been formulated at that early date. Without any refinement of terms we may state exactly enough the difference between the two conceptions. Let any one ask himself why he is present at a certain lecture. If he gives the answer in terms of the Past, in terms of push, in terms of matter or of mass and motion, all of which expressions are equivalent, then he has no choice. Let him begin the statement where he may, at 7 o'clock or 6 or 5 or 4, or a day or a month or a year or a millennium in the past, it is all one; he must describe himself and all his antecedents as pieces of machinery, in fact as automata, in which each state of motion has followed with iron rigor and necessity upon the preceding; he must say that the molecular whirlwind called his brain determined certain quiverings of his efferent nerves, and that these quivers fell upon certain muscles and determined certain contractions and relaxations and consequent motions that finally landed him upon the chair occupied. Such is the present word, such must be the last word, of physical science, and it is a most excellent one, eagerly demanded,



and quite indispensable to any perfect and final explanation. But every one perceives that such a statement, such a deduction of the Present from the Past, however accurate, is and always has been and always will be in all generations incurably lopsided and inadequate. For it states at most and at best only the concatenated antecedents, the material *causes* of the man's presence there; it says not one word about the *grounds* or *reasons* therefor. It answers perfectly the question *how*, but it is absolutely dumb with regard to the weightier question *why*? Now it is precisely this question *why* that every man puts and must put, and no man can be satisfied till it is answered. Moreover, it is a matter of immediate knowledge, as primary as primary can be, that no possible assignment of causes, of antecedent conditions, can ever satisfy the questioner, who is seeking for reasons and not causes. Still further, observe that the only satisfying answer will be in terms of the Future, and not of the Past. The man will say, "I desired to hear and see something or somebody." At each instant the desire was a present experience, but the thing desired was and remains from first to last in the Future. At the start he desired to hear the beginning, then he was eager to hear the middle, and finally became impatient to hear the end. When he heard that, he straightway heaved a sigh of relief and hastened home. Once and always his desire is still ahead and beckons him on from instant to instant. It is a voice crying out forever from the bosom of the flying hours. It is the call of the time to come. It is a tug from before, not a thrust from behind; it is the pull of the Future, not the push of the Past. Furthermore, whenever such a reason is assigned, every intelligence recognizes it not only as adequate but as final and incapable of reduction to simpler terms, as an ultimate fact of history. If there is any fault to find, it will be not with the reason but with the man for being drawn on by the reason: it may be said, perhaps, that

he allowed himself to be deceived, that the address was not worth hearing; but it will never be said that the desire, however ill-tutored, was not fully equal to its task, otherwise the man would not have gone.

Moreover it is absolutely inconceivable that any other desire but just that one, namely, the desire to be there at that time, whether to hear or perhaps to see some one else, should have drawn any one thither. This exact precision is very noteworthy. Still further, the desire must have been intense and strong enough, but it may have been a thousand times intenser and yet the result exactly the same. In the well-known song, if the Arab lover had come from the desert on a camel instead of a horse, his desire would have been the same though his speed would have been less. Entirely different is it in the material world, where there exists an exact quantitative equivalence between cause and effect. A small bullet may indeed kill a man as dead as a large one, but not with the same mangling. Here then in the world of reasons we find no place for the fundamental principles of the world of cause and effect. Here too we find finally but one Reason in a million forms and a thousand degrees. It is Will, Desire, Wish, Want, Appetite, Craving, Yearning, Impulse, Instinct, Life-urge, or what you will. All these terms are drawn from our own conscious experience and designate aspects or expressions of the one fundamental element, expressions immensely higher, more refined, and more elaborate than is this one uniform element in its unconscious manifestations—as if we should attempt to express the mental operations of a new-born babe in terms of the logistic of Peano. Since we may never hope to find in human speech a really appropriate name for this ground-element, for it lies far below the reach of earthly tongues, it might be well to employ some purely arbitrary and symbolic term, as Alpha. Or if you think the Greek Alpha and the Hebrew Aleph are rather overworked, you

might choose the Syriac equivalent Olaf. In this case the rose by any other name will smell as odorless.

However you call it, this Alpha has the one eternal and immutable distinction, that it faces always the Future, intent upon a goal that is often unseen but lies always ahead, that it never looks back upon the Past, but presses forever on. So far as we can see, the Past has for it no existence whatever. It may indeed sound strange thus to speak of the Future as solely determining the Present, since we are so used to speak of the Past as the sole-determiner. And yet such is the unique form of inner experience. Peer as deeply and as fixedly as you will into the abysses of your own being, you shall always find therein that it is all and only the Future that determines and in a way creates the Present. At every instant the Past crumbles into nothingness under our feet and we flee from it as from a levee sinking into the Mississippi, while the eternal Future, like the eternal Feminine, draws us upward and on. Not merely, mark you, the immediate Future; in higher and higher consciousness, yea, even in sub-conscious depths the voice cries out from the wilderness of the far-beyond; the endless stretches of the ages-to-come catch up the call and plead with impassioned eloquence; the broad opening vistas of time-to-be resound with the hopes and fears, the aspirations and aversions of the race of man, of the heart of existence itself, and these, yea, these alone it is that guide the bird of history through all her far-homing flight.

We may say then that it is To-morrow and not Yesterday that makes To-day what it is. In itself it is no more and no less plausible that the Future than that the Past should determine the Present; but the undeniable fact is that the determinant is the Future and not the Past. The Future and the Past appear as two aspects of the timeless Now, which stands related to them much as an algebraic expression stands related to its endless trains of integrals

and derivatives. If you have given an algebraic expression, as the square root of  $z$ , you shall find it Janus-faced, looking two opposite ways, and you may ask what are its derivatives and what its integrals, the answer being an indeterminate series of each. To take a simpler example, and at the same time to get another view of the matter, if you have given any set of numbers or symbols as 2, 3, 5 and are asked to combine them according to fixed rules, as by multiplication, the operation is called direct, the result is just one thing, namely, 30. But if you have given this result 30, and are called upon to determine whence it came by multiplication, the answer is again definite but is not unique. It might be 2, 3, 5 or 2, —3 and —5, or —2, 3, —5, or —2, —3, 5. In general the inverse operation has a multiple result, where the direct has a single result. We all know that the equation of second degree has two roots, while that of third degree has three, and so on. The problem of solving such an equation is an indirect or inverse problem. Similarly the universal Alpha or Reason is in each case single, whereas the Cause in the Past might be any one of many. Likewise the problem of the Past is such an inverse problem, as for instance to trace back the history of the moon and to find when and where the earth and the moon were one and how they parted company and became more and more estranged, the problem to which Geo. H. Darwin and later T. J. J. See have consecrated so much patience and labor and insight, and with such widely discrepant results. But the problem of the Future is direct and its answer is unique. Only *one* total aspect of creation will be presented to-morrow at noon; whatever it may be, the total aspect will be unique. No two equally justified forms of the same event will or can present themselves, like the two roots of a quadratic equation.

Here then are the wide world-views contrasted. On the side of matter, of cause and effect, the universe is one

immeasurable Memory. On the side of mind, of purpose and aim, it is one unbounded Hope. According now as the accent falls on the one or the other of these, we have this or that system of philosophy, and temper of culture and type of civilization. During the marvelous nineteenth century, the emphasis fell with a heavy and heavier stroke upon the Past. The key-note of this wondrous orchestration was given by Goethe in his deep-thoughted oracle: "The question for natural science is not what use have oxen for their horns, but how did they come by them?" Here all reference to the future is ruled out decisively; the forward gaze of mind is denied all recognition, the category of purpose is struck out of our thinking. The only question is one of cause and effect; the Laplacian intelligence builds up backward, backward forever, and forward interminably, but notice wherewith it builds. Only with the ashes of extinct volcanoes. Never at any point can it insert purpose or aim or meaning into its sublime construction; never can it even raise, much less answer, the question, *Why?* There was in fact no why, no reason for aught in this endless history. When under its all-conquering analysis a far-off temporary halting-place is reached, what then do we find? Naught but one all-embracing incompressible frictionless or perhaps subfrictional ether, curdling here and there into atoms or electrons. I leave out, of course, the more recent theories of relativity and of quanta, which no way impair the foregoing statements.

And now when this same Laplacian intellect attempts to construct a Future, what can it, what must it create? Only an inverted replica of the Past, wherein there neither is nor ever can be any purpose or aim or meaning, even unto the ages' end. On, on eternally the atoms, the electrons, the quanta whirl like a dumb dance of insensate demons, but at no point is there a vestige of any *value*,

at no point is the pull of the Future admitted, everything is deduced with mathematical rigor from the aboriginal push of the Past. And what becomes of consciousness, of the psychical in all its forms, with all its concomitants and derivatives of pain and pleasure, of desire and will, of instinct and reason, of thought and feeling, of good and bad, of right and wrong? Of everything in fact that has any meaning or value in the life of the world? Ah well! This consciousness is to be sure a little puzzling. Since it can never be explained as a phenomenon nor stated in terms of mass and motion, suppose we call it an epiphenomenon and let it go at that. In any case it does not amount to much, it does not last long; with all its kith and kin it is only a sporadic phosphorescent gleam in the infinite dark of time on the silent-rolling surge of matter, such as the voyager admires at midnight while his keel is furrowing the equatorial ocean. What if the earth should have been and continue to be inhabited by this intruding conscious or even subconscious soul for 40,000,000 of years? That need not disturb the serenity of the materialist who reflects that 100,000,000 of years are not even a drop of the bucket in comparison with the dead wastes of endless ages that stretch unvexed of any soul before and after. Rejoicing in these boundless Saharas he may tolerate however grudgingly the thin line of the Nile of consciousness and sub-consciousness that lies across them.

Uncompromisingly as I reject this whole scheme of naturalism, let me not for a moment be thought as questioning its great significance, or even its complete justification as a partial and provisional interpretation of the course of history. It is only as a final and complete interpretation that we must condemn it totally. The immeasurable moving picture that the soul makes to itself of its own experience and of the Universal-Soul experience in which it shares and which it projects upon the screen of the

Past, must be described and can be described only in terms of mass and motion, or as Hertz would say, in terms of space, time and mass; it must be understood and can be understood only under the category of cause and effect. We bid then the physicist and the biologist God-speed in their high emprise, even though they confound our intelligence with their new concepts and swamp our language with their new terms. But we should remember and never forget that it is a picture they are dealing with, a shadow of the psychic realities, and not the perfect essence thereof. Let them study and explore ever so profoundly the laws of nature, but let us never fail to keep in mind that the laws of nature are the thoughts of mind, that they are universal and objectively valid only because the nature and therewith the thought of mind remain in broad outline the same for all men, for all the living, who differ from one to another much as two consecutive curves of the same family, enveloped by the same curve; as two circles that intersect each other with centers only just apart.

Bearing this in mind we hail with pride and joy every new conquest of science, every new concept or theory that serves to set in more perfect order the wondrous picture called the world of sense, whether it be Darwinism or Mendelism, whether vitalism or mechanism, whether electrons or quanta or the relativity of time and space. Yea, we shall behold unperturbed the removal of all things that can be shaken, well knowing that the things unshakable still remain. Moreover we shall perceive clearly that it is a false antagonism between the causative and the teleological conceptions of the universe. Willingly we surrender the world of matter to the despotism of the Past, to the tyranny of causality, to the blind predestination of the primal Push. For we know that this world is only a kinematographic representation of the eternal life of the spirit, the only ultimate reality. Willingly we admit that there is

no end nor aim nor purpose in the blinding storm of the atomic world, for we know that the Kingdom of Ends is within us. It is in the conscious and no less in the unconscious life of the soul that we find the Future sole-reigning, that we behold unveiled the face of the everlasting Striving, that we feel the pull of the increasing purpose of the universe.

From this point of view we shall be able to solve many antinomies, to reach out the hand of sympathy and friendship to warring champions of opposing doctrines. In the initial number of the new scientific quarterly, *Bedrock*, we find a powerful plea for Darwinian natural selection as against the *élan vital*, the life-urge of the Bergsonian theory. The author, Professor Poulton of Cambridge University, attempts to test the two views by two crucial examples, especially by that of the mimetic colors of insects, of which he has made a profound and exhaustive study. He reaches the conclusion that the facts in the case can be understood only in terms of natural selection, of the survival of the fittest, of the successful propagation of certain insects that by some purely accidental spontaneous variation in the markings of their wings secured a more protective coloration than their less fortunate fellows.

Now it is no intent of mine to take up any glove in defense of M. Bergson, who certainly has enough eager disciples of his own, whom we all admire even though undazzled by the sudden outburst of splendor in his halo. But I wish to note that Poulton's argumentation, even if accepted at its face-value, glances harmlessly by the position we have sought to make clear. We have no interest whatever in denying the agency of natural selection either in this case or in many others, where it seems to have been more certainly active. In fact it would appear that such selection could work far more effectively on the finite mutations of De Vries than on the infinitesimal variations of



Darwin. One thing, however, is certain. Though natural selection may and even must play a large part in the *survival* of the fittest, it can play no part at all in the *arrival* of the fittest. Even Poulton must speak of "spontaneous variation." It is not necessary to press the sense of the word "spontaneous." Let us grant that it is used only in lack of some better word, that Poulton does not mean that the organism willed or desired or even tended to vary, but only that it varied through unknown mechanical causes. Let us take the extremest case and make the largest possible concession, namely, let us think of what you may let me call the universal life-front, the total advancing aspect of life at any moment, as a huge surface, a sphere surface, for example, and as budding or putting forth variations at every point in every direction; and let us suppose some of these struck down, destroyed, but others preserved to form a new life-front with new variations every way at every point, some preserved, some destroyed, and so on without end. We cannot represent more vividly or more favorably this Darwinian doctrine. But does not any one see that the budding or varying every way at every point remains unexplained? That we have merely described the way *in which the process goes on*, but have not even tried to state the nature or reason of the process itself? That we have only stated how A turns into B, and B into C and so on, but have left untouched the questions, *Why* was there any turning at all? *Why* was there any growth? *Why* any inheritance? *Why* any variation? None of these questions are put, hence none of them are answered in the foregoing scheme.

But Poulton may say, they *can not* be answered, they *should not* be put, in any scientific study of the nature process. Granted, as long as that process is conceived and stated in mere terms of mass and motion. Nevertheless the questions are actually put, whether answerable or not; they are in fact insistent. No rational being can escape

putting them except by refusing to think. The fact then that they are not answerable, nay more, the fact that they cannot even be properly put in the system of matter, of mass and motion, is a decisive demonstration that such a system can never be ultimate in human thinking. However excellent the service it may render as a preliminary and preparatory organization of thought, it nevertheless finds no place within itself for the question Why? no place for the concept of reason, of end, of aim, of purpose. But all these are native to the very thought-process itself by which the system is upbuilt. They can not be stamped out of existence, they can not be disregarded; expel them with a pitch-fork, they instantly return. You can no more get rid of them by thinking than you can think away thought itself.

We must then yield them an eternal abiding place. In terms of them we must construct our theory of the universe, in view of them we must direct our life. Since they cannot be found in the objective world of atoms, of electrons, of quanta, of time and space, there remain at the bottom of our system only the immediately perceived or implied inexpugnable verities of our inner psychic or spiritual experience, whether conscious or unconscious. These are the things that cannot be shaken, these are the living stones in the temple of our world-theory. It may be—indeed, it certainly is—incomparably more difficult to construe the universe as a system of reason and purpose than as a system of cause and effect, nevertheless we cannot finally evade the task, and surely it is noble and inspiring beyond measure. Unto this task it is that the twentieth century is invited, and “along the line of limitless desires.” It is in fact an awakening to a new and higher form of self-knowledge than Spirit has hitherto attained, a distincter recognition of the Future as the matrix of the Present, a pursuit more conscious than ever before of the flying goal of history. We dare reverse the homely aphorism of Goethe and affirm

that, without abandoning the causal view of the Past, we must turn to the teleological view of the Future, we must seek to understand the total present as a system of living and striving instincts, where instinct itself in Hartmann's phrase "is the (conscious) choice of means towards an end unconsciously chosen." So then it is the end, the aim, that rises before us as guiding star in this twentieth century interpretation of history, yea, we may indeed proclaim, "The Kingdom of Ends is drawn nigh." It is not strange that the vision of the poet should outrun the perception and reasoning of the savant or even the philosopher, nor that we should find all we have been striving here to express already adumbrated in the great Tennysonian quatrain:

"That God, which ever lives and loves,  
One God, one law, one element,  
And one far-off divine event  
To which the whole creation moves."

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